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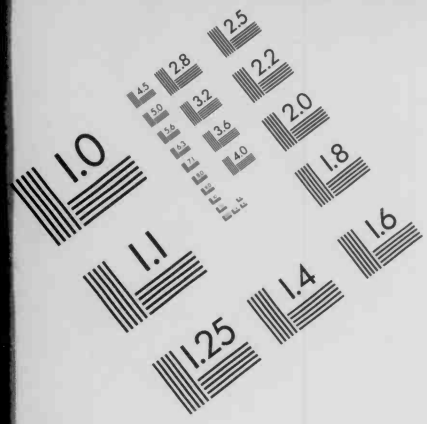

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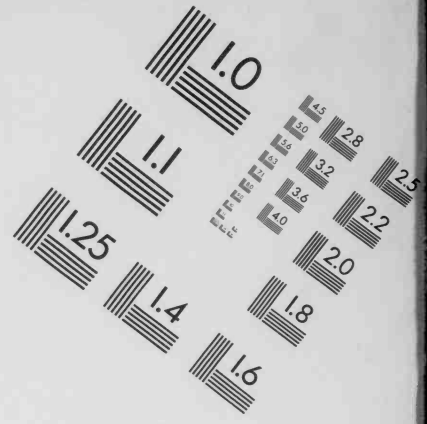

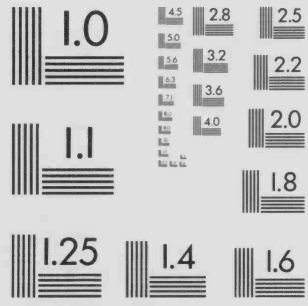

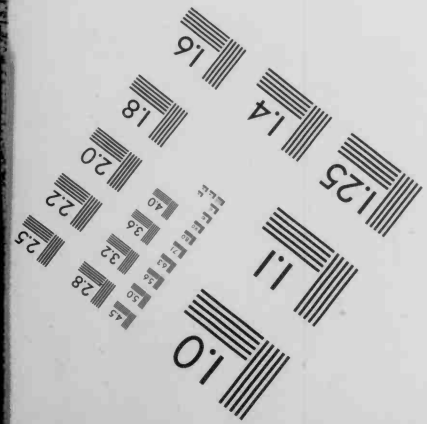

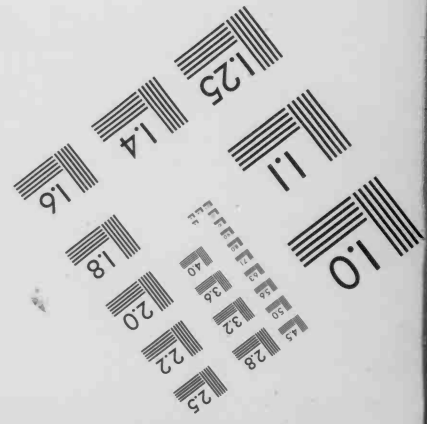

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No 9

SCIENCE IN ITS RELATION TO THE ETHICAL SENTIMENTS

ADDRESS DELIVERED BEFORE THE SOCIETY OF SIGMA XI AT THE STATE UNIVERSITY OF IOWA, OCTOBER 7, 1903, BY LAUNCELOT W. ANDREWS.

Experts in medical jurisprudence recognize the existence of what they call the *stigmata of occupation*. These are changes produced in the hands or other parts of the bodies of workingmen by the trades in which they are engaged. The marks are so characteristic and indelible as to be successfully used in criminology for determining from examination of a cadaver what had been in life the occupation of the deceased. We are told that shoemakers, laundresses, coal-miners, coachmen, book-binders, stone-masons, carpenters, drummers, clock-makers, and, in short, practically all those who earn a livelihood by physical labour carry such marks with them to the grave; silent witnesses to the nature of their daily toil.

What is true in this respect of the manual labourer holds also of the brain worker. The stigmata of *his* trade are not indeed impressed upon his skin or his finger nails or his joints, but they are none the less indelibly stamped on his mental attitude, his thoughts and his feelings. No elaborate argument is requisite to show, that between the manifold activities of the mind of man there is a relationship so intimate, that whatever profoundly affects the mode of thought must likewise influence the esthetic, ethical and spiritual being.

To enter into any serious or elaborate discussion of the problems thus suggested is clearly too great an undertaking for an hour's talk; but, since it is a grateful task once in a while to forsake the familiar highways of one's own professional or intellectual domain to stroll upon the by-paths, or even to essay a speculative climb among the mountains which lie along the frontier, I venture to invite you to bear me company this evening on such an excursion into the borderland between Science and Ethics.

Science holds a cornucopia of gifts more bountiful, more amazing and far more beneficent than any which Aladdin owed to his wonderful lamp. From its exhaustless depths riches without end are showered upon the nations, and, more precious still, longer life for mankind and with it things which make a greater span of years worth the living; wider liberties with shorter hours of labor for the sweating sons of toil; diminished days of disease and pain; less of the woes of war, more fruitful Peace; better opportunities for personal growth, usefulness and happiness. Rich indeed is the bounty; too rich, too obvious and abiding to be gainsaid by any.

But there are, after all, greater things in human life than wealth, greater even than liberty or opportunity or culture. These things *may* be sordid: they *are* sordid unless enlightened and guided by noble sentiments. Has Science ought to do with feeling, with sentiment? Or is it concerned with thought alone, clear as ice and as cold? This question is not unworthy of consideration. It is rendered particularly timely and weighty just now by the fact that the education of the young is daily becoming more predominantly scientific in character. If the notion regarding the trend of scientific thought is correct; if the influence of such studies is purely materialistic, is it not high time to call a halt in the progressive infusion of a steadily increasing amount of scientific teaching into the higher schools and universities, accompanied as it is and must be by reduced attention to and emphasis upon the so-called "humanities"? The spirit of commercialism is rampant enough all over the world, perhaps nowhere more so than in our own country. The invasion of the universities by courses of instruction in commerce is one symptom of the movement adverted to; the proposed shortening of college courses to three or even to two years is another. There is surely no present danger that too little heed will be paid to the things that are styled "practical," that is, to the income immediately exchangeable at par and on sight for this world's goods. But what of the reverse of the proposition? Is there not pressing, present danger that bread-and-butter studies will usurp the place if not the functions of those branches of learning which give outlook and inspiration to the soul and will steal much of the time which should be devoted to the latter?

The question is, then, both fair and pertinent whether scientific studies belong to the bread-and-butter order and should be treated as such; or whether they have a wider, deeper significance than this and are capable, if properly handled, of taking the place to a considerable extent of the humanities and of fulfilling similar functions; whether they can manifest themselves to be, in fact, the legitimate twentieth century offspring and successor of the classical and philosophical training of the past.

The answer to this question must depend primarily upon the influence which the scientific training and habit of mind can be shown to exert upon the social, ethical and altruistic sentiments. If that influence is such as to dull the sentiments named, or to leave them undeveloped, the conclusion is warranted that general acceptance of an education mainly scientific involves nothing less than a threat at the very existence of the social fabric. The qualities of Patriotism, Self-sacrifice and Faith constitute a bond which unites men in every social organism and which is the mainstay of the social order. These qualities are emotional rather than logical. The emotion may spring from either of four sources: tradition, religion. reflection, or the elemental personal instincts.

Some philosopher has wisely said: "Sing me the songs of a people and I will tell you their history." The emotions which Time has subdued and which bold deeds have crystallized into history are those which find natural expression in song. The poetry of young and vigorous peoples, before whom their history lies, is not of an emotional type, for the keenest feeling is wont to find expression rather in action than in verse. At a very early stage in social evolution, the purely personal passions begin to be subjugated to emotions founded in tradition and religion, while at that period, and for long after, those based on the intellect are subordinate. The whole intellectual, as compared with the religious and militant, life plays but a very subordinate rôle in primitive society. It is only in highly complex civilizations that the intellectual factor becomes general enough, strong enough and distinctive enough to exercise any very powerful influence upon the emotions and, through them, upon the conduct of life.

Through the past and almost down to our own day matters of education and intellectual activity were so closely bound up with those of religion that differentiation is difficult. All education was under the control of religious orders and was deeply imprinted with the sectarian stamp. Under such conditions it is impossible to apportion justly the credit due for growth of higher ethical standards between the religious and profane parts respectively of the educational and intellectual life prior to the nineteenth century. Certain is alone the fact that the improvement in moral and ethical conditions has steadily kept pace with the march of knowledge and especially with that variety of knowledge which comes from the study of objective phenomena of Nature. During the dark ages, with a better religion but worse intellectual status than prevailed in the best period of the classical era, the ethical standards of Europe were lower, which would seem to indicate that intellectual deterioration can more than counteract religious progress in the field of practical ethics. Many of the eastern races, possessing elaborately developed religious but no intellectual life of the sort referred to, have evinced no appreciable moral or ethical advance within the memory of man. These phenomena are, of course, susceptible of a variety of interpretations and they are adduced here for their suggestiveness rather than as arguments.

It will be instructive to glance at the causes leading to the divorcement of secular from sectarian teaching, a movement distinctly modern. Instead of "causes" we may safely write "the cause," for the reason that one of them is so predominant that the others are relatively insignificant. A marked characteristic of the newer learning, called scientific, is its comparative freedom from the trammels of tradition, as contrasted with the scholarship of antecedent epochs. Acquisition of knowledge by the method of experimentation, research and induction at once depends upon and incul-

cates openness of mind. Those who would learn nature's lessons can not be subservient to the authority of great names or of tradition. The first lesson they must acquire is that of intellectual freedom. On the other hand, influence of tradition has in the past always been most potent in religious sects, without much distinction of name or tenets.

In the sharply contrasted attitude of science, on the one hand, and of sectarian religion on the other, is to be found the cause of the disruption of religious and secular education. The dependence on tradition which is essential to sectarian instruction is fatal to scientific development, or to any form of education of which science forms a considerable part. The divorce took place slowly and painfully. Although necessary and inevitable it has been, as I believe, not without injurious consequences on both sides. Religious education has suffered and, indirectly the sects generally, by being further isolated from the awakening influence of scientific thought and, hence, by falling more exclusively under the sway of mere conservatism and tradition: while, to look at the other side of the picture, secular education is imperiled by withdrawing the steadying conservative force which is so pronounced a characteristic of religious teaching. It is impossible to be blind to the effects of this latter circumstance, which, in depriving the schools of the guidance of former standards, has thrown their doors wide open to invasion by a host of ill-conceived educational fads, loudly heralded by the cozening cry of "New lamps for old, new lamps for old!"

If the secularization of education was and is, both necessary and desirable, there must lie within it the promise of a remedy for the evils referred to. The cure is to be sought in the increasing conservatism of science and in its direct influence on what I may, for lack of a better name, denominate the Ethical Sentiments.

All the natural sciences in the earlier stages of their growth were devoid of general principles.* As a definition of science, I would adopt the following paraphrase of one propounded by Kant: A SCIENCE IS A SYSTEM OF OBSERVATIONS AND COGNITIONS UNITED INTO A CONSISTENT WHOLE BY THE RELATIONSHIP OF CAUSE AND EFFECT. The less developed sciences are, then, empirical in character. Generalizations introduced in course of time, are, at first, of limited scope. Later, general laws and principles are propounded and finally firmly established. Now, the acceptance of these broad or universal canons must limit freedom of speculation. We can only guess freely when we do not *know*. The inauguration of this phase in the development of our knowledge of nature can but exert a profoundly modifying impression on scientific thought, rendering it more conservative, less subject to the temporary sway of ill founded hypotheses, more respectful in its attitude toward authority and tradition.

* Mathematics, as occupying an intermediate position between the natural sciences and metaphysics, is not included here.

Such a mutation as this has actually occurred to an appreciable degree within the memory of men not yet old and is likely to go much further during the next generation. We may then hope that a scientific conservatism will arise capable of performing the most valuable functions of the philosophico-religious conservatism of the past. No one who compares the materialistic literature of the Buechner school of thirty years ago with the speculative writings of leaders of science to-day will doubt that we are in fact entering on a new era of thought in this regard.

In considering the present or probable future bearing of science upon ethics, it is of importance to note that the broad and far reaching truths of science, its great laws, its fundamental principles, are not strictly scientific in origin, but are philosophical or metaphysical. To put it tersely, science begins where speculation ends. I do not hesitate to assert that all of the great basic principles of science and many of its minor laws were first propounded as the fruit of philosophical reflection rather than as an outcome of the study of phenomena. The story of metaphysical thought is a record of numberless surmises, doctrines, guesses if you like; but metaphysics furnishes no adequate basis for forming a final judgment as to the relative validity of these often contradictory speculations. This is the special function of science; to examine the suggestions and surmises supplied in so abundant a harvest by the procreative imagination of philosophers, to subject them to the only possible conclusive criterion by comparing them, feature by feature, with the phenomena of the actual world, discarding as illegitimate those which do not conform and accepting those that are in harmony with nature.

In a word; science deals with the theories of metaphysicians much as it does with the physical manifestations of the universe, objectively and critically, serving mankind rather by eliminating the false than by discovering absolutely new truth; securing a yield of fruit, like a skillful gardener, by patient destruction of weeds and cultivation of the soil.

If, then, science does not produce its own principles or doctrines but simply selects them, we shall not expect her to be of service to ethics by discovering or promulgating new principles of conduct. She may, however, be of assistance in eliminating those that are false and can strengthen those that are true and important by furnishing new grounds for their acceptance. Ultimately, she may be reasonably expected to weld together the surviving principles into an orderly system and so to furnish the world, for the first time, with a real science of ethics. It is, however, not necessary to look so far into the future to find a correlation between science and ethics.

One of the first ethical sentiments to be developed and one of the most

persistent is that of Patriotism, a passion so strong that from early times many have been found ready to sacrifice at its behest their dearest personal possessions, hopes and desires. It is a sentiment which, in its varied forms, has always particularly appealed to the imagination of mankind, probably because it is impersonal in character. On the other hand love of kindred or of woman is instinctive and elemental. Its law is sacrifice, and the sacrifice, when necessary, is made by normal man less as a volitional act than as a simple submission to the most potent force which rules the human heart. Such instances of self-abnegation are therefore accepted much as a matter of course. They are received with a feeling of warm sympathy rather than with admiration. Failure to make these sacrifices when occasion demands is met by condemnation or contempt. But we admire and greet with homage the spirit exhibited by the Roman judge, who condemned his loved son to death for treachery to the state, perceiving that in this act there could be no element of compensation again.—An officer accepts a mission to enter the lines of the enemy as a spy. He alone is fitted by special knowledge for the task. The chance of success is small, its reward nothing tangible, neither honor nor glory. Moreover, all his feelings as a man not bred to deceit, revolt at the quality of the service. Yet, in spite of everything, being free to go or stay, he goes.

In such cases as this we recognize the existence of Patriotism as an ethical sentiment strong enough to command great sacrifices, even when unsupported by adventitious motives, as ambition or love of glory, and we concede to it a position among the altruistic proclivities higher than that held by those which are more primitive or instinctive and less under the domination of the will. Patriotism does not, however, always exhibit itself in a form so noble. Its lower manifestations are commoner, as seen in indiscriminate glorification of one's race, country, or province and in equally indiscriminate prejudice against customs and institutions that are foreign. In extreme instances this debasement may go so far as to transform patriotism from a virtue into a vice and make it defeat its own ends. Then, pride of country becomes blatant, aggressive jingoism and the praiseworthy desire to have the fatherland advance through its own excellencies to greater influence, power and responsibility is replaced by an ignoble impulse to deny all merit to dwellers on foreign shores and to beat down their competition by brute force. Is it to be wondered at that there are those who question altogether the quality of patriotism as a civic virtue?

Science, nevertheless, sees in patriotism an emotion nearly related to the elemental instincts and springing from a common cause. As the reason for being of the latter is the perpetuation of the species, so is the end and normal objective of the former the preservation of the social-political in-

stitutions and the ideals for which the state or race stands. In the course of the development of high civilization out of barbaric conditions the effective units are nations rather than individuals. Each nation represents an experiment in human institutions and in the practical application of certain ideals. The rate of progress which the world makes depends upon the value of these separate experiments, that is, primarily, on the thoroughness with which they are tried.

That nation, then, contributes most to the world's advancement which does not really change its standards but which adheres to its ideals and its social institutions tenaciously, modifying details in accordance with the teachings of experience but carrying the main experiment to a final judgment. Such a course as this is impossible where the views of individuals are not to a considerable degree cheerfully surrendered to the composite ideal of the state. The only way in which the citizen can subordinate his individual views and conduct, without loss of self-respect or independence of thought, is by the cultivation of a habit of respect for and adherence to the composite ideal embodied in the king or the state. This habitual feeling is the sentiment of patriotism and it can, on occasion, rise to the intensity of a passion. It is, like other passions, subject to aberrations and diseased manifestations, but it is in its origin normal and in its effect perpetuates a certain moral and political system and makes for stability and progress.

Science then furnishes a reason for the existence of patriotism and also points out that it is one of the most important of the emotions because it leads to preservation and heritage of the best fruits of civilization and to an exhaustive trial of the relative merits of diverse codes of morals and manners.

The domains of the nations resemble scientific laboratories on a gigantic scale in which moral and social doctrines of religious sects and postulates of philosophic schools are assayed in the crucible of experience. The patriot is he who watches over such an experiment with zealous care, without fear or favour, devoted wholly to giving it every chance of success, guarding it against forcible interruption from without or ignorant interference from within. He does not shrink from modifications when these become necessary, for the experiment of which we speak is a long one and there is plenty of time. He is not afraid of adopting at home the results obtained abroad when these are promising, for the experiment is a complex one and has many branches. He does not seek to meddle with the social or political enterprises however foolish they may appear, which foreigners may be trying in their own territory, for this would distract his attention from the experiment at home and imperil its outcome. He rejoices when aliens voluntarily undertake institutions similar to his own and lends every encour-

agement and assistance to such enterprises, knowing that his own people may profit by the lessons those experiments will teach. Again, to repeat, the patriot finds in science a justification of his patriotism, a judgment of it as one of the noblest of emotions and a warning against its perverted forms.

Exercise of any of the virtues of primitive or of cultivated man involves some sort of immediate or ultimate Self-sacrifice. There is no community of men so loosely united that the individual who habitually refuses to sacrifice his personal desires or needs for others is not an undesirable member of it. Hence, it naturally comes about that readiness to sacrifice self is looked upon as a virtue *per se*, without regard to the object of the abnegation. Hence the multifarious forms of self-torture practiced by the savage tribes, the sects of the flagellants, the self-immolations, the hermits and the wearers of hair shirts. It is only in the latest, most advanced, stages of civilization that the idea of self-sacrifice as a thing meritorious, apart from its aim, begins to be abandoned. It can not be said to have entirely lost its hold even yet. Is it not probable that the change of view on this matter is chiefly due to the direct influence of scientific thought? Science considers nothing apart from its results and the wastefulness of objectless self-torment is so evident as to bring the practice into immediate conflict with scientific teaching. Conversely, however, science discloses both the necessity for and the justification of self-sacrifice on two grounds; firstly, that a certain measure of this quality is a condition of enlightened egoism; secondly, that the welfare of the community and the evolutionary progress of the race itself demand individual abnegation. The readiness to make these requisite sacrifices grows with the progress of mankind because the inexorable law of competition and development slowly but surely leads to the elimination of those groups of men who fail to honor and encourage altruistic tendencies and, in the final outcome subjects the individual whose propensities are entirely egoistic to dangers greater than those which his selfishness obviates.

Accordingly, in the light of science, self-seeking appears as something characteristic of the lower phases of evolution, as a hindrance to higher development and as a degenerate trait in civilized man. This view, and I would emphasize the fact that it is the only one which science does or can espouse, inevitably tends to make the quality of selfishness, like a physical deformity, distasteful and abhorrent.

The opinion, once generally shared, that there is in science something antagonistic to Faith is scarcely entertained to-day by intelligent persons, but the older view, although abandoned in its cruder original form, still manifests an influence in the notion that science is wholly apart from faith, is cool in its attitude toward it and instills unfaith rather than otherwise in

its devotees. Discussion of this point properly falls within the scope of our present inquiry if we admit that faith is an ethical sentiment. To me it appears to be such. Faith is a trait which may exist independently of any particular object. All religious sects rest upon it without distinction of creed, for the creed is a creature of faith, not faith of the creed. Faith is not exclusively a religious quality. It is also an intellectual factor of vast importance. It stands opposed to suspiciousness. It is an attitude of the mind, a habit of accepting things at face value till experience demonstrates the need of discounting. The barbarian suspects his neighbor and trusts no man, for suspiciousness is a mark of the savage. It leads him to fear and hence to oppose what is new. The strength of tribes and nations is founded on the mutual confidence of men, for faith in its rudimentary forms makes organization possible, while more faith renders that organization strong and effective. It is of the very essence of civilization, of union, of coöperation. It is a potent bond which combines individuals into a compact unit, lending to each a share of the strength of all.

In the sciences, faith in the laws and principles already established is essential to progress and to sound scholarship. A few doubting Thomases are to be met with in every community who find delight in distrusting all the scientific laws or doctrines which the world at large regards as, at least provisionally, demonstrated. These men are not willing to stand on the shoulders of their predecessors and reach higher, but, impelled by fatuous conceit, hark back to the beginnings of things and seek by their own powers to attain results which are only possible to that coöperative effort for which they lack the necessary faith. They are "cranks" indeed; but cranks of a sort that drive no machinery beyond the "idle-wheels" in their own ill-balanced brains!

Above all is faith a discriminating trait. Belief in one thing usually involves a doubt of something else. If you have confidence in the law of gravitation, you will mistrust alleged spiritualistic phenomena of table tipping. If you believe in the law of conservation of energy, you will be a sceptic regarding perpetual motion schemes: if you are a faithful disciple of physiological science, you will be a doubter as to the merits of patent medicines and nostrums: if your credence in the mathematical laws of chance never wavers, you will distrust your ability to break the bank at Monte Carlo!

Faith, tenacious in things fundamental but not obstinate as to form, adapting itself to the "deeper insight that wider knowledge brings," but never yielding hold on fixed principles at the demand of the highwayman, Expediency—*this* is surely an ethical sentiment, for it is a guide and rule for the conduct of life. It is the lever of Archimedes by which he who rightly wills may lift the world.

I have failed in my purpose this evening if in the mind of any the impression is left that I would present Science as the only need in human life, or as a substitute for religion or spirituality. Is religion the loser if it can be shown that the spiritual life has in science not an opponent nor even a cold observer but an ally and a friend? Assuredly not a loser but inestimably a gainer if science, although unable to create religious concepts or spiritual ideals, is capable of enlightening, adorning and enriching them, as I have endeavored to show that it does:—a gainer also if this ally can assist her in striking off the gyves and shackles ignorantly placed upon her by the sects, and so prepare the way for practical harmony and unity of religious effort.

To perceive that the distinction between the artistic, spiritual and intellectual activities of man is largely artificial is worth the pains it costs: to see that these things are naught but different aspects or phases of the Godlike in man is to profit much, for this insight, well used will put him who has attained it on guard—perhaps not against the Devil and all his hosts—but against many perversions of impulses intrinsically noble; pride, pigheadedness, intemperance, meddlesomeness, voluptuousness, oppression, flattery, servility, rancor, bigotry, intolerance and all uncharitableness.